

University of Windsor  
Department of Electrical and Computer Engineering  
***ELEC 8590 Design Automation for FPGAs***  
Winter 2021

**Programming Assignment #2:  
Single Layer Maze Router**

Due: Tuesday, March 30, 2021

Implement a single layer maze router using the Lee-Moore algorithm described in the class. Your program should take input from a netlist file that has the following format: The first line consists of a single integer  $n$ , this implies the grid size is  $n \times n$ . The grid cells are numbered from 0 to  $n-1$  in each dimension. A “//” indicates start of comments on each line.

The next set of lines each have the keyword *obstruction* followed by X and Y coordinates of that obstruction on the grid. Example of *obstruction* is a logic cell that covers part of a grid.

The last set of lines each have the keyword *net* followed by X and Y coordinates of the *source* and the *sink* (e.g. X1 Y1 X2 Y2). Assume that the router is required to route only two terminal nets.

A sample input file is given below.

```
10      // 10 x 10 grid
obstruction 2 2
obstruction 2 4
obstruction 5 5
obstruction 2 7
net 1 0 4 4
net 3 3 8 9
```

You should display the progress of your program as it routes each net on the grid using a graphics window. The netlist files for testing your program will be provided soon. **Give a demo of your program on or before the last day of submission.** Also prepare a report that describes the flow of your software, major functions and data structures used and how they interact. Also email a copy of your code. Your program should try to route ***all*** the nets given in each input netlist. If that is not possible, it should try to route as many nets as possible.

Lastly, feel free to contact the instructor if you have any questions or clarifications about this programming assignment.

Good luck!